

Applicant : Randy Dean May  
Serial No. : 10/766,327  
Filed : January 29, 2004  
Page : 3 of 11

Attorney's Docket No.: 18327-012001

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A system for detecting ethylene oxide in air comprising:  
a light source emitting light having a width sufficiently narrow to conduct single line spectroscopy at a wavelength of approximately 2.2 microns, wherein said light source is positioned to emit light through a sample of air;  
a detector configured to detect the intensity of light emitted from said light source; and  
an electronics unit coupled to said detector for determining the level of ethylene oxide in the sample of air.
2. (Original) The system of claim 1, wherein said light source is chosen from the group comprising: a tunable diode laser, a color center laser, a quantum cascade laser, and a VCSEL.
3. (Original) The system of claim 1, wherein said detector is an InGaAs detector.
4. (Original) The system of claim 1, wherein said light source emits light at a wavelength of approximately 2.22 microns.

Applicant : Randy Dean May  
Serial No. : 10/766,327  
Filed : January 29, 2004  
Page : 4 of 11

Attorney's Docket No.: 18327-012001

5. (Original) The system of claim 1, wherein said light source emits light at a wavelength of approximately 2.216 microns.

6. (Original) The system of claim 1, wherein said light source emits light at a wavelength of approximately 2.195 microns.

7. (Currently Amended) A system for detecting ethylene oxide in air comprising:  
a light source emitting light having a width sufficiently narrow to conduct single line spectroscopy at a wavelength of approximately 1.6 microns, wherein said light source is positioned to emit light through a sample of air;  
a detector configured to detect the intensity of light emitted from said light source; and  
an electronics unit coupled to said detector for determining the level of ethylene oxide in the sample of air.

8. (Original) The system of claim 7, wherein said light source is chosen from the group comprising: a tunable diode laser, a color center laser, a quantum cascade laser, and a VCSEL.

9. (Original) The system of claim 7, wherein said detector is an InGaAs detector.

Applicant : Randy Dean May  
Serial No. : 10/766,327  
Filed : January 29, 2004  
Page : 5 of 11

Attorney's Docket No.: 18327-012001

10. (Original) The system of claim 7, wherein said light source emits light at a wavelength of approximately 1.69 microns.

11. (Original) The system of claim 7, wherein said light source emits light at a wavelength in the range of approximately 1.64-1.65 microns.

12. (Currently Amended) A method for determining the level of ethylene oxide in a sample of gas comprising the following steps:

providing a light source emitting light having a width sufficiently narrow to conduct single line spectroscopy at a wavelength chosen from the group comprising 1.6  $\mu\text{m}$ , 1.645  $\mu\text{m}$ , 1.692  $\mu\text{m}$ , 2.195  $\mu\text{m}$ , 2.2  $\mu\text{m}$ , and 2.216  $\mu\text{m}$ ;

positioning a detector opposite the light source to detect the level of emitted light; supplying a sample of gas between the light source and the detector; and detecting the amount of light passing through the sample of gas.

13. (Currently Amended) A system for detecting ethylene oxide in air comprising:

a light source emitting light having a width sufficiently narrow to conduct single line spectroscopy at a wavelength where ethylene oxide molecules absorb light at a substantially greater level than other molecules within air, wherein said light source is positioned to emit light through a sample of air;

a detector configured to detect the intensity of light emitted from said light source; and

Applicant : Randy Dean May  
Serial No. : 10/766,327  
Filed : January 29, 2004  
Page : 6 of 11

Attorney's Docket No.: 18327-012001

an electronics unit coupled to said detector for determining the level of ethylene oxide in the sample of air.

14. (Original) The system of claim 13, further comprising: a plurality of sample areas, each sample area containing air that may contain ethylene oxide; and a sample area selector, for selectively delivering air from said plurality of sample areas to pass between said light source and said detector.

15-16 (Canceled).

17. (Currently Amended) A system for detecting ethylene oxide in a sample of gas comprising:

a Herriott cell having two opposing mirrors;

a light source emitting light through said Herriott cell and configured to reflect off the mirrors to pass through the gas at least two times;

a detector configured to detect the intensity of light emitted from said light source after the light reflects off the mirrors at least two times; and

electronics coupled to said detector for determining the level of ethylene oxide in the gas;

and

Applicant : Randy Dean May  
Serial No. : 10/766,327  
Filed : January 29, 2004  
Page : 7 of 11

Attorney's Docket No.: 18327-012001

wherein said light source emits light having a width sufficiently narrow to conduct single line spectroscopy approximately at a wavelength chosen from the group comprising: 1.6  $\mu\text{m}$ , 1.645  $\mu\text{m}$ , 1.692  $\mu\text{m}$ , 2.195  $\mu\text{m}$ , 2.2  $\mu\text{m}$ , and 2.216  $\mu\text{m}$ .

18. (New) An apparatus comprising:

means for emitting light at a wavelength having a width sufficiently narrow to conduct single line spectroscopy at a wavelength corresponding to an ethylene oxide absorption line;

means for detecting a level of emitted light; and

means for supplying a sample of gas between the means for emitting light and the means for detecting a level of emitted light.

19. (New) An apparatus as in claim 18, wherein emitted light is at a wavelength chosen from a group comprising 1.6  $\mu\text{m}$ , 1.645  $\mu\text{m}$ , 1.692  $\mu\text{m}$ , 2.195  $\mu\text{m}$ , 2.2  $\mu\text{m}$ , and 2.216  $\mu\text{m}$ .

20. (New) An apparatus comprising:

means for emitting light having a width sufficiently narrow to conduct single line spectroscopy at a wavelength where ethylene oxide molecules absorb light at a substantially greater level than other molecules within a sample of air;

a detector configured to detect the intensity of light emitted from said means for emitting light; and

Applicant : Randy Dean May  
Serial No. : 10/766,327  
Filed : January 29, 2004  
Page : 8 of 11

Attorney's Docket No.: 18327-012001

an electronics unit coupled to said detector for determining the level of ethylene oxide in the sample of air.

21. (New) An apparatus as in claim 20, wherein emitted light is at a wavelength chosen from a group comprising 1.6  $\mu\text{m}$ , 1.645  $\mu\text{m}$ , 1.692  $\mu\text{m}$ , 2.195  $\mu\text{m}$ , 2.2  $\mu\text{m}$ , and 2.216  $\mu\text{m}$ .

22. (New) An apparatus as in claim 20, wherein said means for emitting light is chosen from a group comprising: a tunable diode laser, a color center laser, a quantum cascade laser, and a VCSEL.